



Prehistoric Monsters



Karen loves to play the game Prehistoric Monsters. At each level of the game, the T-Rex must battle and defeat a series of different dinosaurs. The pattern of dinosaurs is different with each level. Karen recorded the number of dinosaurs for the first 3 levels of the game. Find the number of dinosaurs Karen forgot to record for each level of the game.

Level I		Level II		Level III	
Battle	Number of Dinosaurs	Battle	Number of Dinosaurs	Battle	Number of Dinosaurs
1	4	1	3	1	6
2	5	2	6	2	
3	6	3	9	3	12
4	7	4		4	15
5		5	15	5	18
6		6		6	
7		7		7	



Unit 4 Lesson 2

Prehistoric Patterns

Anna loves to play Prehistoric Monsters II, the sequel to Prehistoric Monsters. Complete the following tables for the first 3 levels of Prehistoric Monsters II.

Key: Each ● represents 1 dinosaur.

Level I

Battle Number	1	2	3	4	5	6	10
Number of Dinosaurs	3	5					
Model				● ● ● ● ● ● ●			

Level II

Battle Number	1	2	3	4	5	6	10
Number of Dinosaurs	4				16		
Model		● ● ● ● ● ●					



Prehistoric Patterns

Level III

Battle Number	1	2	3	4	5	6	n
Number of Dinosaurs							$3n + 2$
Model							

- 1 How many additional dinosaurs are fought in each successive battle in:
 - a) Level I?
 - b) Level II?
 - c) Level III?

- 2 The expression $5n + 3$ represents the number of dinosaurs defeated in each battle, n , in the game Dinosaur Wars. Find the number of dinosaurs defeated in each of the first 5 battles of the game.



Unit 4 Lesson 2

Determining the Rule

Determine a rule for each arithmetic sequence.

1

Position	1	2	3	4	n
Value of Term	12	16	20	24	

2

Position	1	2	3	4	n
Value of Term	4	9	14	19	

3

Position	1	2	3	4	n
Value of Term	1	5	9	13	

4

Position	1	3	5	7	n
Value of Term	5	9	13	17	

Write an expression that can be used to find the n th term for each sequence listed below.

5 7, 13, 19, 25, 31, ...

6 -1, 2, 5, 8, 11, ...



Independent Practice

To write an expression that describes a sequence, you need to:

- Look for a rate of change between the terms in the sequence.
- Determine if there is a constant value.
- Determine if the relationship is true for all terms in the sequence.

What is the expression that can be used to find the value of any term in the sequence?

{4, 7, 10, 13, ...}

Create a table that relates each term to its position in the sequence and look for the rate of change between consecutive terms.

Position	1	2	3	4	n
Value of Term	4	7	10	13	

$\begin{array}{c} \diagdown \quad \diagup \\ +3 \quad +3 \quad +3 \end{array}$

Since the value of each term increases by 3 as the position increases by 1, the rate of change is 3. In the 1st position, 1 needs to be added to the rate of change of 3 to get the value of the term; therefore, the constant is 1. The rule is $3n + 1$.

Determine if the relationship is true for all terms in the sequence.

Position	1	2	3	4	n
Process	$3(1) + 1$	$3(2) + 1$	$3(3) + 1$	$3(4) + 1$	
Value of Term	4	7	10	13	$3n + 1$

The relationship is true for all terms in the sequence, so the rule is $3n + 1$.

Write an expression that describes each sequence.

1

Position	Value of Term
1	8
2	10
3	12
4	14
n	

2

Position	Value of Term
1	8
2	14
3	20
4	26
n	



Unit 4 Lesson 2

Complete each table and write an expression that describes the sequence.

3

Position	1	3	5	6	7	9	n
Value of Term	18	28			48		

4

Position	1	3	5	7	9	11	n
Value of Term	6	18		42			

Let n represent the position of a number in the following sequences. Write an expression that can be used to find the value of any term in each sequence.

5 5, 9, 13, 17, 21, 25, ...

6 9, 12, 15, 18, 21, 24, ...

If n represents a number's position in a sequence, write the first 5 terms described by each expression.

7 $\frac{1}{2}n$

8 $3n + 4$

9 $(n + 7) + n$

10 $n - 1.5$



Omar's Battle



Omar and Ali love to play the game Prehistoric Monsters. They recorded the number of dinosaurs that must be defeated in each level in the table below.

Level	Number of Dinosaurs
1	
2	
3	
4	

Omar claimed he could use the rule $4n + 3$ to determine the number of dinosaurs at any level, n . Ali claimed the rule should be $3n + 4$. Who was correct? Justify your answer.

FOR TEACHER USE ONLY:

a. YES NO Student arrives at a correct solution?

	4	3	2	1
b. Conceptual Knowledge				
c. Procedural Knowledge				
d. Communication				



Unit 4 Lesson 2

- 1 Which expression can be used to find the n th term in the following sequence, where n represents a number's position in the sequence?

Position	Value of Term
1	3
3	7
5	11
7	15
n	

- A $n + 1$
B $2n + 1$
C $n + 2$
D $2n$
- 2 If n represents a number's position in the sequence, which sequence does the expression describe?

$$\frac{n+2}{3}$$

- A $1, 1\frac{2}{3}, 2\frac{1}{3}, 3, 3\frac{2}{3}, \dots$
B $\frac{2}{3}, 1\frac{2}{3}, 2\frac{2}{3}, 3\frac{2}{3}, 4\frac{2}{3}, \dots$
C $1, 1\frac{1}{3}, 1\frac{2}{3}, 2, 2\frac{1}{3}, \dots$
D $1, 3, 6, 9, 12, \dots$

- 3 Which expression can be used to find the value of the term in the n th position for the table below?

Position	Value of Term
1	0.25
2	0.75
3	1.25
4	1.75
n	

- A $0.5n$
B $0.5n - 0.25$
C $n + 0.25$
D $n + 0.5$
- 4 Which expression can be used to find the n th term of the sequence below?

6, 11, 16, 21, 26, ...

- A $5n + 6$
B $5n$
C $n + 5$
D $5n + 1$